

Rotifers and Macrobioti, after being perfectly lifeless, have been revived after five months (Leeuwenhoek, 1719), two years and a half (Fontana, 1769), days (Spallanzani, 1777), several years (C. A. S. Schultze, 1834, and Creplin, 1837), six months (C. A. S. Schultze, 1838), three years (the same author, 1840), many years (the same, 1861), hours (Greeff, 1865), days, weeks, months, and years (Preyer, 1864-1889).

Whoever thoroughly examines the shrivelled Rotifers and Arctiscoids as they lie in the drying-oven, and notes how, on the evaporation of the water emitted by them at the moment of drying, after being completely isolated on a slip of glass they become motionless, and, exhibiting no change whatever for whole days and months, first swell up on being moistened and then begin to move, will arrive at the conviction that there is in this case no possibility of a *vita minima*, a minimum of physiological metabolism, since water is wanting. It is excluded as certainly as in the case of the frozen frog's heart. There remains only a potential life, which, through the emancipating process of anabiosis, is transformed into kinetic or actual life. The interruption of this latter through freezing and drying occurs in an enormous number of cases in nature, probably favoured in the case of many organisms (*e. g.* on the bark of trees) by a specific adaptation, and confirmed by heredity as being a highly advantageous property. The pause in the life of the individual comes to an end either through death in consequence of irreparable injury to the lifeless organism or through natural anabiosis, as, for instance, in the soil when it thaws in spring, or in the dust of the gutter of the roof when rain falls after a drought in summer, and so on. The organic machine therefore does not perish every time it stands quite still any more than the clock breaks down every time the pendulum ceases to swing.

The frozen and desiccated animals, destitute of all trace of circulation, are not dead, but merely do not live until enabled to do so by anabiosis.

Berlin,  
Dec. 4, 1890.

LX.—*New Scarabæidæ in the British Museum: a Fifth Contribution.* By CHARLES O. WATERHOUSE.

SINCE my last contribution I have been determining the species of *Helicocopriss*, *Catharsius*, and *Copriss*. This is a difficult task at any time, and is rendered ten times more so by entomologists who have attempted to found species on

single female examples. As, however, I have exercised great care, I trust I shall not be found to have redescribed any characterized species among the following.

*Heliocopris Hunteri*, sp. n.

Nigro-piceus; capite ruguloso, cornubus tribus fere æqualibus erectis instructo; thorace brevi, sat fortiter reticulato-ruguloso, antice declivi, pone oculos profunde exciso, parte elevata disci in cornu longo horizontali acuminato producta, cornu ad apicem plus minusve exciso, angulis anticis acutis prominulis lævibus; elytris nitidis, leviter striatis, striis dorsalibus parce punctulatis, interstitiis planis, parce subtiliter punctulatis, basi quinque-tuberculatis.

Long. 17-20 lin.

*Hab.* E. Africa, Masai (*C. V. Hunter and F. J. Jackson, Esqrs.*).

Allied to *H. neptunus*, Bohem., but with the armature of the head and thorax quite different. The head is rather large, with three erect acuminate horns, one central and two lateral. A small-developed example has the middle horn shorter and more obtuse, and the lateral ones are only indicated by a slight swelling on the margin. The thorax with a single porrect discoidal horn, somewhat as in *H. hamifer*, Harold, but without the angular enlargement beneath, the apex nearly always notched. The space above the anterior angles is impressed and shining, and the margin behind each eye has a deep, almost circular emargination, leaving the projecting angle of the head behind the eye visible. The anterior angles are very acute and porrect, beset with reddish-brown hair. The elytra have five tubercles at the base, one on each of the second, fourth, and fifth interstices and two on the third; there is sometimes a trace of one on the sutural interstice.

*Heliocopris operosus*, sp. n.

Piceus

♂. Capite ruguloso, sat rotundato, medio cornubus duobus erectis acuminatis perparum divergentibus instructo, clypeo antice medio triangulariter paullo emarginato et utrinquo leviter sinuato; thorace brevi, confertim granulato, antice verticali magis rugoso utrinque impresso, impressione lævi, parte elevata triangulari utrinque leviter bisinuata, medio obtuse producta, ad apicem vix emarginata, lateribus pone angulos anticos sinuatis; clytris nitidis, leviter striatis, striis parce obsolete punctulatis, interstitiis parce sat distincte punctulatis, basi trituberculatis.

♀. Capite paullo angustiori, vertice carina elevata (angulis dentiformibus) instructo; thorace antice carina leviter flexuosa, lateribus pone angulos anticos minus sinuatis crenulatis; elytris basi sine tuberculis.

Long. 17 lin.

*Hab.* Africa (*Burchell*).

Allied to *H. atropos*, Bohem. The head has a distinct but not very deep triangular emargination in the middle of the front margin. The male has the two erect horns placed at the middle, wide apart. The female has a strong carina more on the vertex. The male has the sides of the thorax rather strongly emarginate before the anterior angles, which are nearly right angles; the raised dorsal part is in outline nearly an equilateral triangle. The thorax of the female has the anterior carina slightly arched forwards in the middle and then gently sinuate on each side, the sinuosity about equal in extent to the part that is arched forwards. The male has three tubercles at the base of the elytra, two on the fourth interstice and one on the fifth; there is also a trace of another on the third interstice.

*Catharsius Jacksoni*, sp. n.

Niger, nitidissimus; capite lato, leviter ruguloso, vertice lævi, postice cornu longo, gracili, acuminato, recto, instructo, margine antico medio sat late triangulariter emarginato, utrinque lævissimo sinuato; thorace confertim subtiliter granuloso, antice fere verticali subtiliter punctulato, medio lævi, cornubus quatuor crassis acuminatis, parte elevata subtilissime coriacea et subtiliter sat crebre punctulata, linea mediana leviter impressa; elytris leviter striatis, striis fere lævibus, interstitiis fere planis, subtilissime sat crebre punctulatis; pygidio sat crebre punctulato.

Long. 11 lin.

*Hab.* E. Africa, Masai (*F. J. Jackson, Esq.*).

Of all the species of *Catharsius* known to me this is the most like the true *Côpris* of the *lunaris* group, and is particularly like the Japanese *C. pecuarius*, Lewis. Compared with *C. lunaris* the head is larger and the anterior emargination wider; the horn is erect and slender. The thorax has the four horns approximately equal, the lateral ones as in *C. lunaris*, the middle pair more conical, acute, separated from each other by a nearly equilateral-triangular space; the sides are arcuately rounded, the anterior angles a little greater than right angles. The elytra are short, the striæ very lightly impressed, the eighth with the usual carina only at the base for about two lines in length. The posterior tibiæ have the two carinæ well marked.

*Catharsius Anderseni*, sp. n.

Oblongus, convexus, nigro-piceus, sat nitidus; capite lato, semi-circulari, confertim rugoso, antice medio emarginatione parva, vertice tuberculo minuto nitido; thorace convexo, æquali, disco sat fortiter sat crebre punctato, lateribus granuloso-rugosis, puncto laterali vix conspicuo; elytris nitidis, fortiter striatis, interstitiis convexis sat crebre sat fortiter punctatis, earina laterali usque ad medium continuata; tibiis anticis tridentatis.

Long.  $6\frac{1}{4}$  lin.

*Hab.* Lake Nyassa (*Andersen*).

Allied to *C. inermis*, F., or *C. latifrons*, Harold, but very different from both on account of its strongly sculptured head and thorax and convex, punctured interstices to the elytra. The thorax has no trace of impressed median line; the disk is shining, with rather strong punctures, which are slightly separated from each other at the posterior part, but have a tendency to unite transversely in the front part; at the extreme base and at the sides the surface is rather coarsely rugose; the sides are nearly parallel at their middle, very obliquely turned in in front, but forming a rather more distinct angle than in either of the above-mentioned species. The elytra have the striæ deeply impressed, with very faint indication of crenulation; the interstices are very convex, strongly punctured (compared with its allies), the punctures slightly separated from each other. The posterior tibiæ are rather more abruptly enlarged at their apex than in *C. inermis*, the upper carina is scarcely indicated.

*Catharsius opacus*, sp. n.

Rotundato-ovalis, convexus, niger, opacus; capite rugoso, antice triangulariter emarginato, et utrinque lævissime sinuato; thorace creberrime granulato-asperato, lateribus medio subrectis; elytris postice bene rotundatis, tenuiter nitido-striatis, striis parce punctulatis, interstitiis planis, subtilissime coriaceis opacis, subtilissime obsolete punctulatis, carina laterali sat valida, usque ad callum apicalem continuata; tibiis anticis tridentatis, posticis apicem versus gradatim latioribus; corpore subtus nitido.

♂. Capite vertice cornu brevi conico; thoracis disco paullo bigibboso, antice declivi.

♀. Capite tuberculo minuto; thorace æquali.

Long.  $6-6\frac{3}{4}$  lin.

*Hab.* Lake Ngami (*Andersen*).

This species is very close to *C. peleus*, Ol., and represents that species in South-east Africa. The head has the anterior

emargination less deep, and consequently the two triangular teeth are less prominent. The elytra in *C. peleus* are dull, but when examined by a magnifying-glass numerous minute shining spots may be seen; and as these are absent in *C. opacus* the elytra are still more dull and are opaque even at the suture near the scutellum; the interstices are perfectly flat, which they scarcely are in *C. peleus*, especially at the sides.

Possibly the male I have described may not be fully developed, and in that case the cephalic horn might be more like that in *C. peleus*.

A small male has only a light impression in the front of the thorax. The female has no trace of impression.

*Copris megaceratoides*, sp. n.

Grisco-niger, parum nitidus; capite fortiter crebre punctato, antice late leviter emarginato, vertice cornu crasso, acuminato, curvato; thorace fortiter crebre punctato; elytris tenuiter striatis, striis distincte punctatis, interstitiis planis, sat nitidis, sat crebre sat fortiter punctatis; tibiis anticis quadridentatis, dente superiori parvo, tibiis posticis sat longe tridigitatis.

♂. Capitis cornu magno, compresso, fortiter punctato, pone medium subito recurvo, basi bidenticulato, ad apicem subtus denticulato; thorace disco bene elevato, utrinque late leviter impresso, parte elevata in cornubus duobus acuminatis distantibus antice curvatis partita, margine antico medio tuberculis duobus instructo, angulis anticis sat porrectis acutis.

Long. 10 lin.

♂, var. *minor*. Capitis cornu breviori, curvato, acuminato; thorace disco minus elevato, utrinque late impresso, parte elevata subplanata, subquadrata, antice emarginata, angulis obtusis, lateribus cariniformibus, antice declivi carinis duabus acutis instructa, prope angulos anticos dente triangulari elevato instructo.

Long. 9 lin.

*Hab.* Senegambia.

I have given the above name to this species on account of the resemblance in general form of the cephalic and thoracic horns to those of *Megaceras chorinaeus* in the Dynastidæ. The thorax has an angle projecting forward rather beyond the posterior lateral angle of the head; the sides are somewhat straight anteriorly, and near the front angle there is an acute ridge, which in the smaller male is developed into a triangular tooth. In the large male there are two approximate acute tubercles close to the front margin; in the smaller male these are much reduced and are connected by two strong ridges with the elevated tubercles on the disk.

This species is nearly allied to *C. ochus*, Mots.



*Copris globulipennis*, sp. n.

Niger, convexus; capite rugoso, antice medio inciso; elytris bene convexis, rotundatis, subtilissime striatis, interstitiis planis vel fere planis, sat crebre punctatis.

♂. Capite antice incisura parva, vertice cornu longo ad apicem leviter curvato, antice sublævi, postice rugoso obtuse serrulato; thorace bene convexo, antice declivi fortiter granulato utrinque fossa magna sublævi, fossa externe dente magno triangulari limitata, disco postice elevato, convexo, obsolete punctato, basi lineaque mediana impressa fortiter punctatis, parte elevata antice obtuse quadridentata, dentibus duobus medianis magis approximatis; elytris subopacis obscure punctatis, striis 1-2 apice fortiter impressis.

♀. Omnino nitidus, minus convexus; capite antice fortiter anguste inciso, obtuse bidentato, vertice tuberculo parvo emarginato instructo, postice fere lævi; thorace minus convexo, antice et ad latera crebre asperato-punctato, disco postice sat crebre obsoletius punctato, linea mediana fortiter punctata, antice carina obtusa curvata; elytris paullo longioribus, nitidis, evidenter punctatis, sutura ad apicem rugosa striis 1<sup>a</sup>-4<sup>m</sup> apice fortiter impressis.

Long. 9 lin.

*Hab.* Cape of Good Hope.

This very distinct species may be placed near the preceding, but it is very unlike any known to me. I believe it is well known in collections under the name which I have retained for it.

*Copris sodalis*, Walker.

The type of this species is a small female from Ceylon. The only specimen in the Museum Collection agreeing with it is from Cachar. It is very near *C. sulcicollis*, Lansb., and has the same deeply impressed striæ to the elytra and strongly punctured pygidium, but differs in having the whole of the disk of the thorax and the sides nearly to the middle almost impunctate. It differs from the female example of *C. sarpedon*, Har., in having the sides of the thorax rather more rounded anteriorly and in the punctuation.

*Copris sinicus*, Hope.

I think this can scarcely be separated from *C. sulcicollis*, Lansb. The typical specimen, however, has only the outer tubercles on the disk of the thorax, the middle pair being merely indicated by a slight swelling.

*Copris capensis*, sp. n.

Statura *C. lunaris*, niger, nitidus; capite crebre rugoso, postice lævi, margine antico sat profunde inciso; elytris tenuiter striatis, interstitiis parum convexis; pygidio fortiter sat crebre punctato.

♂. Capitis cornu longo acuminato fere recto, postice prope basin dentibus duobus parvis armato; thorace antice declivi, lobo mediano supra subtilissime parce punctulato, antice late triangulariter emarginato (vel recte truncato) angulis acutiusculis, parte declivi crebre fortiter punctata angulis solum lævibus, dente laterali valido compresso acuto.

♀. Capitis cornu brevi sat acuminato, apice in tuberculis parvis terminanti; thorace rugoso, disco postice lævi, antice abrupte declivi.

Long.  $10\frac{1}{2}$ – $11\frac{1}{2}$  lin.

*Hab.* South Africa (*Dr. A. Smith*).

Apparently a common species and in many collections under the above name, but I am unable to find it described. It much resembles *C. lunaris*, but is larger; the head has a similar incision in front, the posterior projecting angles are a little less acute; the elytra have the striæ rather finer and the interstices generally less convex. The male has the horn on the head similar, perhaps a little more compressed laterally, the two small tubercles appear a little more removed from the base. The thorax is similar, except that the anterior lateral angles are less obtuse; the smooth cavity on each side of the disk is very deep and in the fully developed male reaches almost to the base; the median impressed line is almost obsolete; the lateral tooth is somewhat similar to that in *C. lunaris*, but is larger and more directed forwards and outwards, but not so much as in *C. anceus*; the sides are rather strongly punctured, the punctuation extending a little on to the raised disk; the largest male has the front angles smooth.

The female is rather less convex; the thorax is strongly rugose at the sides, with all the posterior part of the disk smooth, the anterior declivity (which is not separated by any distinct ridge) is transversely rugulose.

A small female ( $7\frac{1}{4}$  lines long) apparently referable to this species has no declivity in front; this and one of the larger females have the elytra somewhat castaneous.

*Copris lunarioides*, sp. n.

Oblongus, minus convexus, sat parallelus, niger, nitidus; capite maximo, antice acute inciso, ruguloso, postice lævi; elytris leviter striatis, striis fere lævibus, interstitiis parum convexis; pygidio impunctato.

♂. Capitis cornu compresso, acuminato, leviter curvato, antice punctulato, postice rugoso; thorace antice truncato, parte mediana lævi antice paullo angustata, ad apicem emarginata quadrituberculata, antice lævi, utrinque late excavato, crebre asperato, dente laterali valido compresso, triangulari.

♂, *var. minor*? Thoracis lobo mediano antice crebre granulato.

♀. Capitis cornu sat elevato, transversim compresso, ad apicem paullo latiori et emarginato; thorace dimidio anteriori rugoso, basi lævi, lobo mediano obtuso antice a carina limitato, dente laterali minus elevato.

Long. 10–13 lin.

*Hab.* Abyssinia, Nyanza; Masai (*F. J. Jackson, Esq.*); S. Africa (*Dr. A. Smith*).

This is a common species, known, I believe, under the above name, and also confounded with *capensis*. It is a flatter insect than *C. lunaris* and more parallel, the parallel appearance being partly due to the great width of the head. The thorax is rather parallel-sided. The large male has the thorax almost without punctuation except the deep cavity on each side of the disk and in the lateral fovea; the median lobe is emarginate in front, with its angles obtusely dentiform and with a very small tooth slightly removed from the angle; the anterior surface of this lobe is smooth and shining, and it has on each side three or four minute tubercles.

In the smaller males the thorax has the median lobe truncate in front, with four small tubercles, the middle pair a little nearer to each other than to the lateral ones; the anterior upper margin is punctured, and the anterior declivity, as well as the cavities and anterior angles, are closely and rather coarsely rugose. The pygidium is smooth or almost so.

It is possible that the specimens which I have described as the large and smaller males may be referable to distinct species. The difference in the sculpture of the anterior declivity of the thorax may be a specific character.

### *Copris Morgani*, sp. n.

Statura omnino *C. lunaris* at minor: niger, magis convexus, nitidus; elytris fortiter crenato-striatis, interstitiis bene convexis, lævibus, stria octava pone medium abbreviata.

Long. 8 lin.

*Hab.* Sierra Leone (*Rev. D. F. Morgan and James Foxcroft*).

This species may be placed near *C. orion* and *C. amyntor*. It is decidedly more convex than *C. lunaris*. The head is relatively narrower, more obliquely narrowed behind the



cheek, so that the projecting lateral angle is a right angle; in front there is a very slight triangular emargination, not an incision. Rather finely rugose, with the vertex smooth.

♂. Head with the horn as in *C. lunaris*, but smooth in front. Thorax as in *C. lunaris*, but more convex, obliquely narrowed in front before the anterior truncature, which is consequently narrower than in *lunaris*. The disk is smooth, with a strongly impressed punctured median line, with a few fine punctures by the middle pair of tubercles; the raised part has four tubercles in front and is relatively shorter and broader than in *lunaris*; the middle pair of tubercles are close together and in the smaller males entirely disappear, so that there is a simple truncate median lobe; the sublateral tubercles are relatively less developed than in *lunaris* and are a little less forward; the anterior declivity is smooth, or with a few punctures in the minor variety; the obtuse carinæ limiting the declivity converge below; the deep cavity on each side is moderately punctured, the anterior angles strongly punctured, the sides are moderately distinctly punctured, and in one specimen are rather strongly punctured.

♀. Head with a short trapezoidal horn, emarginate at its apex. Thorax strongly punctured in front and at the sides, the posterior part of the disk smooth; with an obtuse curved carina in front; the very transverse anterior declivity smooth.

The striæ of the elytra are not only unusually deep, but the oval punctures in them are rather strong, and crowded together so as to form a perfect chain.

*Copris Harrisii*, sp. n.

Oblongo-ovalis, convexus, nigro-piceus, nitidus; capite confertim punctato; elytris leviter crenato-striatis, interstitiis subtilissime punctulatis; pygidio evidenter punctato.

♂. Capite cornu longo sat acuminato parum curvato rugoso, basi postice bidenticulato armato; thorace antice utrinque profundo impresso, lobo mediano quadridenticulato, dente laterali compresso.

♀. Capite cornu brevi compresso ad apicem emarginato; thorace antice carina nitida vix elevata, parte declivi crebre sat fortiter punctata.

Long. 8-8½ lin.

*Hab.* Abyssinia, Shoa (*Sir W. C. Harris*).

This species has the form and appearance of *C. lunaris*. The head has a rather wide and not deep triangular emargination in front, with a slight sinuosity on each side. The elytra are as in *C. lunaris*, but the punctures in the striæ are perhaps a trifle more distinct, but not so strong as in *C. orion*.

The male has the horn on the head as in *C. lunaris*, but is more slender, and the apex itself is not so sharp. The thorax is as in *C. lunaris*, but the median dorsal line is less marked; the median lobe is truncate in front, with four nearly equal and equidistant tubercles; in the fully developed male this lobe is a trifle broader in front than posteriorly, its anterior vertical surface is densely and coarsely punctured, even slightly rugose; the deep impressions on each side of the lobe are rather strongly punctured; the sub-lateral tooth does not turn outwards so much as in *C. lunaris*, and in the fully developed males its upper edge is bisinuate, so that a second obtuse tooth is formed; the middle of the disk is almost smooth or with a few very fine punctures, but the sides of the middle lobe are distinctly punctured, and the front margin of the lobe and the base of the thorax (behind the impression) are still more distinctly punctured, the punctures being moderately close together; at the sides of the thorax the punctuation is rather strong and very close.

The female is like the female of *C. lunaris*, but the thorax is less convex, the median line is less impressed, and there is less anterior declivity. The horn on the head is similar. The thorax has the sculpture very similar, but not *quite* so strong, and is distinctly less rugose near the anterior ridge; there is little or no smooth space at the posterior part of the disk; the anterior declivity is very closely and rather strongly punctured, with a tendency to be rugose.

*Copris orion*, Kl., and *C. amyntor*, Kl.

There is some uncertainty in the identification of these species. In Erman's 'Reise,' Atlas, p. 34, *C. orion* is stated to be the insect known in Ecklon's list as *C. caffra* and *C. brevicornis*; it is distinguished from *C. lunaris* by its small size and "ferner ist das Halsschild, welches bei *C. lunaris* fast glatt zu sein pflegt, hier deutlich und grob punctirt. Die Streifen auf den Deckschilden sind tiefer eingegraben, und die Zwischenräume mehr oder weniger deutlich punctirt." In the Latin diagnosis the expression "*interstitiis obsolete punctatis*" is used.

*C. orion* of Boheman is certainly the insect known to me by that name, having the head almost entirely smooth, with the elytra so smooth that it is only with a strong magnifying-power that the punctures can be seen.

It is just possible therefore that *C. orion*, Bohem., from South Africa, may be distinct from *C. orion*, Klug, from Senegal.

*C. amyntor*, Kl. (Peters's 'Reise n. Mossambique,' p. 242), is from Sena:—"Am ähnlichsten ist diese der *C. caffra*, deren v. Winthem in einem Verzeichniss caffrischer Insecten erwähnt. Sie bildet den Uebergang zu der um eine Linie kleineren *C. orion*, Dej., von Senegal. Von beiden Arten ist sie unterschieden durch den oben nicht glatten, sonst durch Punkte und Runzeln uneben Kopf mit dem darauf sitzenden, an der hinteren Seite flachen, höckerigen, vor der Mitte deutlich zweigezahnten Horn und dem in beiden Geschlechtern starken und dichten fast überall punctirten Halsschild."

It appears to me from these extracts that *C. orion*, Kl., is more strongly punctured than *C. lunaris*, which is scarcely the case with *C. orion*, Boheman; and *C. amyntor*, Kl., is still more strongly punctured, and moreover has the head rugose. The species which I have identified as *C. amyntor* we have received from South Africa and Nyassa. From description I should think it possible that *C. obesa*, Bohem., is the female of this species.

The following notes may be of service in determining the species of this group:—

Elytra deeply striated.	{	Middle lobe of thorax emarginate.	{	Head smooth . . . . .	<i>orion</i> , Bohem.
				Head coarsely punctured . . . . .	<i>amyntor</i> , Kl.
	{	Middle lobe of thorax quadridenticulate.	{	Lateral tooth of thorax simple; clypeus widely triangularly emarginate . . . . .	<i>Morgani</i> , sp. n.
				Lateral tooth of thorax double . . . . .	sp.
Elytra moderately deeply striated.	{	Middle lobe of thorax quadridenticulate, but with the middle pair scarcely developed and appearing like one.	{	Lateral tooth of thorax simple; clypeus with narrow triangular emargination; anterior surface of median thoracic lobe finely punctured . . . . .	<i>modesta</i> , B.
Elytra lightly striated.	{	Middle lobe of thorax quadridenticulate.	{	Middle lobe of thorax with anterior surface coarsely punctured; lateral tooth double.	<i>Harrisi</i> , sp. n.
				Middle lobe of thorax with anterior surface rather finely punctured; lateral tooth simple . . . . .	<i>confusa</i> , B.

*C. orphanus*, Guérin, which is allied to these, is smaller and narrower and has the middle lobe of the thorax tridentate. We have received it from Kilima-njaro, and it seems to me very probable that *C. evanida*, Kl., from Sena, is referable to this species.

*Copris gracilis*, sp. n.

Convexus, piceus, parum nitidus; capite ruguloso, postice lævi; thorace creberrime evidenter punctulato; clytris obscure castaneis, nitidis, crenato-striatis, interstitiis leviter convexus, subtilissime parce punctulatis; pygidio evidenter sat crebre punctato.

♂. Capite cornu acuminato, sat longo, leviter curvato, basi bidenticulato armato; thorace antice abrupte declivi, parte declivi utrinque leviter impressa.

♀. Capite tuberculo parvo ad apicem impresso; thorace æquali.  
Long. 5-5½ lin.

*Hab.* Caffraria.

Resembles *C. sinon*, F., but is less dull and differently sculptured. The head is similar, but is rather more rugulose in front. The thorax is moderately strongly punctured all over, the punctures being separated from each other by nearly the diameter of a puncture; the anterior declivous part is also punctured, but the punctures are a little finer and are very delicate at the upper part of the middle portion; the impressions on each side of the front part are less deep than in *C. sinon* and are punctured; the middle discoidal lobe is similar to that in *C. sinon*, but is much less prominent; there is a lightly impressed median line. The elytra are more shining than in *C. sinon*, with the striæ deeper and the interstices gently convex.

*Copris puncticollis*, Bohem. (according to a specimen kindly sent from Stockholm by Prof. Aurivillius for comparison), is very near *C. gracilis*, but is a little shorter and rather less parallel, and is at once distinguished by the coarser punctuation of the thorax, the punctures being crowded together.

*Copris diversus*, sp. n.

Convexus, piceus, nitidus; capite antice subtilissime punctulato, postice sat fortiter punctato, margine medio late leviter emarginato; thorace punctato, postice lævi, antice leviter declivi; elytris fortiter striatis, striis fortiter punctatis, interstitiis convexus, subtilissime parce punctulatis fere lævibus; pygidio fortiter crebre punctato.

♂. Capite cornu parvo acuminato.

♀. Capite lamina parva ad apicem subtruncata.

Long. 5 lin.

*Hab.* Madagascar, Nossi-Bee.

This species has very much the appearance of *C. minutus*, Drury, but the head has a very broad but not deep emargination.

The male has the head shining, almost imperceptibly punctured, the posterior margin and the side-pieces (behind the oblique line) strongly punctured. The horn is thick at its base, moderately acuminate, gently curved. The thorax is almost imperceptibly punctured, and appears smooth, except a space on each side of the fore part of the disk and the anterior angles, the punctures in these places being rather strong, those on the disk not very close together; there is a strongly impressed punctured median line, extending to the middle of the disk; the anterior declivity is very slight and has a few small punctures on its anterior surface. The elytra have the striæ deeply impressed and strongly and moderately closely punctured, but not nearly so much as in *C. minutus*; the interstices are moderately convex.

The female has the surface of the head a little less shining. The horn has the form of a subquadrate lamina, a little longer than broad, slightly curved, the lower part swollen in front. The thorax has the punctured spaces a little larger and more extended, meeting across the front part of the disk and coming nearer to the base.

*Copris Nevinsoni*, sp. n.

Oblongus, piceus, nitidus; capite lævi; elytris minus nitidis, leviter striatis, striis distincte punctatis, interstitiis perparum convexis, subtiliter laxe punctulatis; pygidio sat fortiter punctato.

♂. Capite antice late leviter emarginato, vertice cornu longo, curvato, acuminato, lævi; thorace disco excavato utrinque in cornu compresso lævi triangulari ad apicem acuminato incurvato, antice ad basin tuberculo minuto munito, ducto, excavatione sat crebre fortiter asperato-punctata, lateribus ante angulos anticos fortiter excisis.

♂, *var. minor*. Thorace disco crebrius fere ocellato-punctato, cornubus minus elevatis; lateribus ante angulos anticos leviter sinuatis.

♀. Capite antice haud sinuato, medio carina brevi obtusa vix elevata, vertice tuberculo vix elevato; thorace parum convexo, disco fere lævi, linea mediana impressa sat fortiter punctata, lateribus sat crebre punctulatis, marginibus ante angulos anticos leviter sinuatis; elytris fere impunctatis.

Long.  $8\frac{1}{2}$ – $9\frac{1}{2}$  lin.

*Hab.* Siam (*J. C. Bowring, Esq.*), Cochlin China.

This species is closely allied to *C. fidius*, but is shining and rather less convex. I have described the large male from Mr. B. Nevinson's collection. Some examples have the



elytra brown. I have seen this species bearing the name *C. malaccensis*, but believe it to be undescribed.

*Copris signatus*, Walker.

This appears to be a common Ceylonese species, easily recognized by the two erect horns on the margin of the head and by the T-formed horn on the vertex.

It is redescribed by Harold under the name of *Catharsius coronatus* (MT. München ent. Verein, i. p. 98). It is allied to *Copris punctulatus*, Wiedem.

*Copris Davisoni*, sp. n.

Statura *C. punctulati*, piceus, subopacus; capite lævi, vertice angulisque posticis punctulatis; thorace creberrime punctato; elytris striatis, striis sat fortiter punctatis, interstitiis modice convexis, distincte punctatis.

♂. Capite antice sicut truncato, margine medio cornu erecto, acuminato, ad apicem paullo curvato, fronte medio cornu erecto parallelo ad apicem binodoso.

♂, var. *minor*. Capitis cornu anteriori minori ad basin antice utrinque dente porrecto instructo.

♀. Capite antice obtuse bidentato, fronte medio tuberculo conico ad apicem subbinodoso.

Long. 6-6½ lin.

*Hab.* Malabar, Nilgiris (*W. Davison, Esq.*).

Very near to *C. signatus*, Walker, but a little narrower.

The male is at once distinguished by the singular armature of the head. The thorax is not quite so coarsely punctured as in *C. signatus*, and in the larger male the punctures have a tendency to run together in a longitudinal direction. In the large male there is a slight indication of a double swelling at the anterior part of the disk. The elytra have the striæ very distinct, the punctures moderately strong and somewhat separated; in the larger males they encroach more on the interstices and appear like pairs of punctures (one on each side of the stria) united on the stria; the interstices are moderately convex, very distinctly punctured, the punctures separated from each other by about two diameters of a puncture.

The female differs from the female of *C. signatus* in being a trifle narrower, with rather more finely punctured thorax; the head with the two anterior teeth a little narrower and separated by a narrower triangular space; the frontal tubercle having a tendency to be binodose at the apex.

I have seen this species bearing the manuscript name *C. rhinocerus*.

*Copris excisus*, sp. n.

Oblongus, parum convexus, sat nitidus, piceus; capite antice lævi, postice subtiliter sat crebre punctulato, vertice transversim leviter impresso; thorace paullo convexo, sat crebre evidenter punctato, basi medio leviter impresso; elytris punctato-striatis, interstitiis sat convexis, subtiliter distincto punctatis; pygidio crebre punctato.

♂. Capite medio tuberculo parvo perparum elevato, clypeo utrinque profunde inciso, parte anteriori in medio recta, utrinque in cornu sat acuminato producta.

♀. Magis nitidus; capite medio transversim paullo elevato, tuberculo parvo conico ad apicem truncato, clypeo margine medio obtuse bidentato, dentibus sat distantibus.

Long.  $5\frac{1}{2}$  lin.

Hab. N. India.

This is allied to *C. signatus*, Walker, but is more convex. The male has a deep incision on each side of the front part of the head, thus leaving a slightly acuminate horn-like process in front; these horns are slightly obliquely directed forwards, and are separated by a somewhat wide space. The thorax is more convex than in allied species; it is rather closely punctured, and the punctures are small, especially at the front part of the disk; there is a slight impression in the middle of the base, continued forwards by some larger punctures. The elytra has the striae very distinct, with distinct transverse punctures, which are not crowded together; the interstices are slightly dull, gently convex, very finely punctured, the punctures not very close together.

The female is altogether more shining than the male. The head has the usual two obtuse teeth in front, but they are more porrect than in the allied species and are separated by a more semicircular space. The thorax has the punctuation similar, but a trifle less fine. The elytra are shining and the punctures on the interstices are very distinct and less fine.

*Copris Andrewesi*, sp. n.

Statura omnino præcedenti, niger, opacus: capite crebre subtiliter punctulato, margine antico solun lævi medio in lobo obtuso producto; thorace confertim sat fortiter punctato; elytris fortiter striatis, striis sat fortiter punctatis, interstitiis bene convexis, impunctatis vel obsoletissime parce punctulatis; pygidio fortiter punctato.

♂. Capite medio carina brevi, postice tuberculo minuto.

♀?. Capite medio convexo, postice tuberculo vix elevato.

Long.  $6\frac{1}{4}$  lin.

*Hab.* India, Belgaum (*H. E. Andrewes, Esq.*).

This species is closely allied to the preceding, but is black and differently sculptured and with more convex interstices to the elytra. The head has a small projecting lobe in the middle of the front margin, with a slight sinuosity in the margin on each side of its base. The thorax is rather strongly punctured, the punctures separated from each other by about half the diameter of a puncture. The elytra have the striae more impressed than in the foregoing species, the punctures encroaching considerably on the interstices; the interstices very convex, almost impunctate.

The male has on the middle of the head a very short transverse ridge, about twice as broad as high, the angles of which are slightly swollen; behind this there is a very slight scarcely raised tubercle.

The female (or undeveloped male?) has the middle of the head slightly convex, and posteriorly there is a very slight tubercle.

[To be continued.]

LXI.—*Reply to the Rev. Canon Norman's Views respecting the proposed rejection of Cyclostoma, with Remarks on No. 10 Rule of the "Stricklandian Code."* By R. BULLEN NEWTON, F.G.S., British Museum (Natural History).

THE abandonment of a familiar name like *Cyclostoma*, proposed by me in last April's number of the 'Annals,' is a matter for considerable regret, though I fear many others equally well known must soon share the same fate and be relegated to the regions of synonymy if we would attain to a proper degree of accuracy in our conchological nomenclature.

Certain objections have been raised in the May number of the 'Annals' to my proposals on this subject by the Rev. Canon Norman which, on being analyzed, betray an amount of prejudice that, emanating from so distinguished an observer, is indeed to be deplored. He charges me with having "misapprehended the facts, and that no need exists for changing the names *Cyclostoma* and *Pomatias* as now in use." To defend my position it will be necessary to recapitulate some of the details connected with the genera and types involved, and for this purpose I shall place them in chronological order, as follows:—